IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A method of operating a plasma processing system, comprising:

positioning a substrate on a substrate holder in a processing chamber;

initializing the plasma processing system;

igniting a plasma by ~~changing an applied RF signal from~~ applying to a first electrode in the processing chamber a first RF signal at a first RF frequency from a first RF source to ignite the plasma and thereafter providing to the first electrode from the first RF source ~~to~~ a second RF signal at a second RF frequency~~, wherein the applied RF signal is coupled to a first electrode in the processing chamber~~; and

sustaining the plasma using the second signal applied to the first electrode at the second RF frequency.

Claim 2 (Currently Amended): The method as claimed in claim 1, further comprising:

establishing a first power level for the first RF signal, wherein the first signal is set to a first output power level.

Claim 3 (Original): The method as claimed in claim 2, wherein the first power level is at least 50 Watts.

Claim 4 (Original): The method as claimed in claim 1, further comprising:

introducing the process gas into the processing chamber, wherein the process gas comprises at least one of a carbon-containing gas, an oxygen-containing gas, a fluorine - containing gas, and an inert gas; and

establishing the chamber pressure below approximately 0.5 Torr.

Claim 5 (Currently Amended): The method as claimed in claim 1, further comprising:

coupling the first ~~frequency source~~ RF signal to the first electrode of the plasma processing system using a first matching network; and

tuning the first matching network to an initial condition for plasma ignition.

Claim 6 (Original): The method as claimed in claim 1, wherein the first RF frequency is at least two percent higher in frequency than the second RF frequency.

Claim 7 (Original): The method as claimed in claim 1, wherein the first RF frequency is at least ten percent higher in frequency than the second RF frequency.

Claim 8 (Original): The method as claimed in claim 1, wherein the first RF frequency is greater than approximately 40.0 MHz.

Claim 9 (Original): The method as claimed in claim l, wherein the first RF frequency is at least two percent lower in frequency than the second RF frequency.

Claim 10 (Original): The method as claimed in claim 1, wherein the first RF frequency is at least ten percent lower in frequency than the second RF frequency.

Claim 11 (Original): The method as claimed in claim 1, wherein the first signal is provided for a first time period, and the second signal is provided for a second time period.

Claim 12 (Original): The method as claimed in claim 11, wherein the first time period has a duration that ranges from approximately ten milliseconds to approximately one second.

Claim 13 (Currently Amended): The method as claimed in claim 1, further comprising:

determining a forward power for the first RF signal ~~being provided by the first frequency source~~;

determining a reflected power for the first RF signal ~~being returned to the first frequency source~~; and

determining when the plasma has been ignited using at least one of the forward power

and the reflected power.

Claim 14 (Currently Amended): The method as claimed in claim 5, further comprising:

determining a forward power for the first RF signal ~~being provided by the first frequency source~~;

determining a reflected power for the first RF signal ~~being returned to the first frequency source~~; and

determining when the plasma has been ignited using at least one of the forward power and the reflected power.

Claim 15 (Original): The method as claimed in claim 1, further comprising:

monitoring the processing chamber by a monitoring system coupled to the processing chamber to monitor optical frequencies in the processing chamber; and

determining when the plasma has been ignited using at least one optical frequency.

Claim 16 (Original): The method as claimed in claim 1, comprising:

monitoring the processing chamber by a monitoring system coupled to the processing chamber to monitor optical frequencies in the processing chamber; and

determining that the plasma has been sustained using at least one optical frequency.

Claim 17 (Original): The method as claimed in claim 5, further comprising:

tuning the first matching network from the initial condition to an operating condition; and

verifying that the plasma has not extinguished.

Claim 18 (Original): The method as claimed in claim 17, wherein the first matching network is tuned from the initial condition to the operating condition in less than 4 seconds.

Claim 19 (Currently Amended): The method as claimed in claim 1, further comprising:

coupling a second RF source to a second electrode in the processing chamber; and

providing additional power to the plasma.

Claim 20 (Withdrawn): A processing system comprising:

a processing chamber having a substrate holder and an electrode configured above the substrate holder;

a pressure control system coupled to the processing chamber; a gas supply system coupled to the processing chamber;

a reduced element matching network coupled to the processing chamber and coupled to the electrode;

a RF generator coupled to the reduced element matching network; and

a control system coupled to the pressure control system, the gas supply system, the monitoring system, the matching network, and the RF generator.

Claim 21 (Withdrawn): The processing system as claimed in claim 20, wherein the reduced element matching network comprises an input terminal, an output terminal, a common terminal, a tunable element coupled between the input terminal and the common terminal, and a fixed element coupled between the input terminal and the output terminal.

Claim 22 (Withdrawn): The processing system as claimed in claim 21, wherein the reduced element matching network further comprises a tuning adjustment device coupled to the tunable element wherein the tuning adjustment device is coupled to the control system and the control system provides signals to the tuning adjustment device and receives signals from the tuning adjustment device.

Claim 23 (Withdrawn): The processing system as claimed in claim 21, wherein the tunable element comprises a variable capacitor.

Claim 24 (Withdrawn): The processing system as claimed in claim 23, wherein the variable capacitor has a tuning range from approximately 5 pf to approximately 250 pf.

Claim 25 (Withdrawn): The processing system as claimed in claim 21, wherein the fixed reactive element comprises a fixed capacitor.

Claim 26 (Withdrawn): The processing system as claimed in claim 25, wherein the fixed capacitor has a capacitance value in a range from approximately 20 pf to approximately 75 pf.

Claim 27 (Withdrawn): The processing system as claimed in claim 20, wherein the reduced element matching network comprises an input terminal, an output terminal, and a common terminal, the RF generator being coupled to the input terminal and the common terminal, the electrode being coupled to the output terminal, and the processing chamber being coupled to the common terminal.

Claim 28 (Withdrawn): The processing system as claimed in claim 20, wherein the RF generator is configured to operate at a first frequency during a first time period and is configured to operate at a second frequency during a second time period.

Claim 29 (Withdrawn): The processing system as claimed in claim 28, wherein the first frequency is at least two percent higher in frequency than the second frequency.

Claim 30 (Withdrawn): The processing system as claimed in claim 28, wherein the first frequency is at least ten percent higher in frequency than the second frequency.

Claim 31 (Withdrawn): The processing system as claimed in claim 28, wherein the second frequency is greater than or equal to approximately 40 MHz.

Claim 32 (Withdrawn): The processing system as claimed in claim 28, wherein the first time period has a duration that ranges from approximately ten milliseconds to approximately one second.

Claim 33 (Withdrawn): The processing system as claimed in claim 28, wherein the RF generator is configured to provide a first output power during the first time period and a second output power during the second time period.

Claim 34 (Withdrawn): The processing system as claimed in claim 33, wherein the first output power is at least fifty percent of the second output power.

Claim 35 (Withdrawn): The processing system as claimed in claim 20, wherein the monitoring system comprises:

a sensor coupled to the RF generator, the sensor providing forward power data and reflected power data to the control system, and the control system is configured to determine processing conditions using the forward power data and reflected power data.

Claim 36 (Withdrawn): The processing system as claimed in claim 35, wherein the control system is configured to use the forward power data and the reflected power data to determine when a plasma has been ignited.

Claim 37 (Withdrawn): The processing system as claimed in claim 35, wherein the control system is configured to use the forward power data and the reflected power data to determine when a plasma is stable.

Claim 38 (Withdrawn): The processing system as claimed in claim 20, wherein the monitoring system comprises:

an optical sensor coupled to the processing chamber, the optical sensor providing optical data to the control system, and the control system is configured to determine processing conditions using the optical data.

Claim 39 (Withdrawn): The processing system as claimed in claim 38, wherein the control system is configured to use the optical data to determine when a plasma has been ignited.

Claim 40 (Withdrawn): The processing system as claimed in claim 38, wherein the control system is configured to use the optical data to determine when a plasma is stable.

Claim 41 (Withdrawn): The processing system as claimed in claim 20, further comprising:

a second electrode coupled to the substrate holder;

a second matching network coupled to the second electrode; and

a second RF generator coupled to the second matching network.

Claim 42 (Withdrawn): The processing system as claimed in claim 41, wherein the second RF generator is configured to provide a first BRF signal to the second electrode.

Claim 43 (Withdrawn): The processing system as claimed in claim 20, wherein the reduced element matching network is mounted above the electrode, and a first transmission line is used to couple the matching network to the electrode.

Claim 44 (Withdrawn): The processing system as claimed in claim 43, wherein the first transmission line is less than 10 cm.

Claim 45 (Withdrawn): The processing system as claimed in claim 43, wherein the RF generator is mounted above the matching network, and a second transmission line is used to couple the RF generator to the matching network.

Claim 46 (Withdrawn): The processing system as claimed in claim 45, wherein the second transmission line is less than 31 cm.

Claim 47 (Withdrawn): The processing system as claimed in claim 20, further comprising: a monitoring system coupled to the processing chamber.

Claim 48 (Withdrawn): A computer readable medium containing program instructions for execution on a processor, which when executed by the processor, cause a plasma processing system to perform the steps of:

initializing the plasma processing system;

supplying a first signal at a first RF frequency to ignite a plasma, wherein a first frequency source is coupled to an electrode in the processing chamber; and

supplying a second signal at a second RF frequency to sustain the plasma.

Claim 49 (Withdrawn): A plasma processing system comprising:

means for initializing the plasma processing system;

means for supplying a first signal at a first RF frequency to ignite a plasma, said means for supplying coupling said first signal to an electrode in the processing chamber; and

means for supplying a second signal at a second RF frequency to sustain the plasma.